

Claims

1. A sensor comprising:  
a sensing element for sensing a sensor characteristic;  
temperature sensing circuitry for sensing a temperature characteristic; and  
output circuitry for outputting a pulse width modulated output signal containing an indication of the sensor characteristic, wherein one of the sensor and temperature characteristics is transmitted as a function of pulse width of the pulse width modulated output signal, and the other of the sensor and temperature characteristics is transmitted as a function of frequency of the pulse width modulated output signal.
2. The sensor as defined in claim 1, wherein the one of the sensor and temperature characteristics is transmitted as a function of duty cycle of the pulse width modulated signal.
3. The sensor as defined in claim 1, wherein the sensing element comprises a pressure sensor.
4. The sensor as defined in claim 3, wherein the sensor is coupled to a fluid-filled bladder for sensing an occupant in a vehicle.
5. The sensor as defined in claim 1, wherein the temperature sensing circuitry comprises a current mirror that generates a current signal as a function of temperature.
6. The sensor as defined in claim 1, wherein the temperature sensing circuitry comprises first and second current mirrors and a ramp generator for generating a ramp signal, wherein the pulse width modulated output signal is generated as a function of the ramp signal.

7. The sensor as defined in claim 6 further comprising a comparator for comparing the ramp signal to an amplitude of the sensor characteristic.

8. The sensor as defined in claim 8, wherein the ramp signal varies as a function of temperature.

9. The sensor as defined in claim 1, wherein the pulse width modulated output signal is transmitted on a current modulated data bus.

10. A sensor comprising:  
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    a first sensing element for sensing a first characteristic;  
    a second sensing element for sensing a second characteristic;  
and

    output circuitry for generating a pulse width modulated output signal containing the first and second characteristics, wherein the first characteristic is transmitted as a function of pulse width of the pulse width modulated output signal, and the second characteristic transmitted as a function of frequency of the pulse width modulated output signal.

11. The sensor as defined in claim 10, wherein the first characteristic is provided as a duty cycle of the pulse width modulated output signal.

12. The sensor as defined in claim 10, wherein the first sensing element comprises a pressure sensing element for sensing pressure as the first characteristic.

13. The sensor as defined in claim 10, wherein the second sensing element comprises temperature sensing circuitry for sensing temperature as the second characteristic.

14. The sensor as defined in claim 10, wherein the first sensor comprises a pressure sensor coupled to a fluid-filled bladder for sensing an occupant in a vehicle.

15. The sensor as defined in claim 10, wherein the pulse width modulated output signal is transmitted on a current modulated data bus.

16. A method of transmitting sensor generated output data in a pulse width modulated output signal, said method comprising the steps of:

sensing a sensor characteristic with a sensor;

sensing a temperature characteristic with temperature sensing circuitry;

generating a pulse width modulated output signal containing one of the sensor and temperature characteristics as a function of pulse width of the pulse width modulated output signal, and the other of the sensor and the temperature characteristics as a function of frequency of the pulse width modulated output signal; and

transmitting the pulse width modulated output signal via an output.

17. The method as defined in claim 16, wherein the step of generating a pulse width modulated output signal comprises generating said one of the sensor and temperature characteristics as a function of duty cycle of the pulse width modulated output signal.

18. The method as defined in claim 16, wherein the step of transmitting the pulse width modulated output signal via an output comprises transmitting the pulse width modulated output signal on a current modulated data bus.

19. The method as defined in claim 16, wherein the step of sensing a first characteristic comprises sensing a pressure with a pressure sensor.

20. The method as defined in claim 19, wherein the pressure sensor is coupled to a fluid-filled bladder for sensing an occupant in a vehicle.

21. The method as defined in claim 16, wherein the step of sensing a second characteristic comprises sensing temperature via temperature sensing circuitry.

22. The method as defined in claim 21, wherein the step of sensing temperature comprises a current mirror for generating a current signal as a function of temperature.

23. The method as defined in claim 16 further comprising the step of applying a signal at startup to generate a constant frequency in the pulse width modulated output signal to communicate data in another mode during startup.

24. A method of transmitting sensor generated output data in a pulse width modulated output signal, said method comprising the steps of:  
sensing a first characteristic with a sensor;  
sensing a second characteristic;  
generating a pulse width modulated output signal containing the sensor characteristic as a function of pulse width of the pulse width modulated output signal, and the temperature characteristic as a function of the frequency of the pulse width modulated output signal; and  
transmitting the pulse width modulated output signal via an output.

25. The method as defined in claim 24, wherein a step of generating a pulse width modulated output signal comprises generating the output signal to contain the sensor characteristic as a function of duty cycle of the pulse width modulated output signal.

26. The method as defined in claim 24, wherein the step of sensing a first characteristic comprises sensing pressure with a pressure sensor.

27. The method as defined in claim 26, wherein the pressure sensor is coupled to a fluid-filled bladder for sensing an occupant in a vehicle.

28. The method as defined in claim 27 further comprising the step of processing the output signal to determine if an occupant is present in the vehicle.

29. The method as defined in claim 24, wherein the step of sensing a second characteristic comprises sensing temperature with temperature sensing circuitry.

30. The method as defined in claim 24, wherein the step of transmitting the pulse width modulated output signal comprises transmitting the output signal on a current modulated data bus.

31. The method as defined in claim 24 further comprising the step of applying a signal at startup to generate a constant frequency in the pulse width modulated output signal to communicate data in another mode during startup.